

What is claimed is:

1 1. A light-emitting unit comprising:
2 a flat polygonal member;
3 a light-emitting member which is provided on a main
4 surface of the polygonal member;
5 three sets of terminals, each set of terminals being
6 provided on a different side of a periphery of the
7 polygonal member; and
8 a wiring pattern which is provided to the polygonal
9 member to connect the set of terminals with the
10 light-emitting member.

1 2. The light-emitting unit of Claim 1,
2 wherein the light-emitting member has a first
3 electrode and a second electrode, and emits light when
4 power is supplied through the first and second electrodes,
5 the set of terminals includes a first terminal and
6 a second terminal, and
7 the wiring pattern connects the first terminal to
8 the first electrode, and the second terminal to the second
9 electrode.

1 3. The light-emitting unit of Claim 2,
2 wherein the set of terminals further includes a third
3 terminal,

4 the wiring pattern connects the third terminal to
5 the second electrode, and

6 the set of terminals is provided so that the first
7 terminal is positioned at a midpoint of the side and the
8 second terminal and the third terminal are symmetrically
9 positioned with respect to the first terminal.

1 4. The light-emitting unit of Claim 1,

2 wherein the light-emitting member is made up of a
3 plurality of light-emitting elements that emit light of
4 different colors,

5 the plurality of light-emitting elements are set at
6 frequent intervals on the main surface of the polygonal
7 member, with each light-emitting element being connected
8 in series with other light-emitting elements that emit
9 light of the same color as the light-emitting element,

10 the set of terminals includes a common terminal and
11 color terminals that correspond to the different colors,
12 and

13 the wiring pattern connects an electrode at one of
14 a low-potential end and a high-potential end of each group
15 of series-connected light-emitting elements to the common
16 terminal, and connects an electrode at the other end of
17 each group of series-connected light-emitting elements
18 to a color terminal that corresponds to the same color

19 as the group.

1 5. The light-emitting unit of Claim 1,
2 wherein the light-emitting member is made up of a
3 plurality of light-emitting elements that emit light of
4 different colors,

5 the plurality of light-emitting elements are set at
6 frequent intervals on the main surface of the polygonal
7 member, with each light-emitting element being connected
8 in series with other light-emitting elements that emit
9 light of the same color as the light-emitting element,

10 the set of terminals includes a common terminal and
11 pairs of color terminals, the pairs of color terminals
12 corresponding to the different colors,

13 the wiring pattern connects an electrode at one of
14 a low-potential end and a high-potential end of each group
15 of series-connected light-emitting elements to the common
16 terminal, and connects an electrode at the other end of
17 each group of series-connected light-emitting elements
18 to a pair of color terminals that corresponds to the same
19 color as the group, and

20 the set of terminals is provided so that the common
21 terminal is positioned at a midpoint of the side and two
22 color terminals that compose each pair of color terminals
23 are symmetrically positioned with respect to the common

24 terminal.

1 6. The light-emitting unit of Claim 5,
2 wherein the side of the polygonal member on which
3 the set of terminals is provided has alternating
4 projections and depressions, and
5 the common terminal and the pairs of color terminals
6 are arranged at the projections and the depressions.

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1 7. The light-emitting unit of Claim 1 further
2 comprising:
3 a resin sheet which has flexibility and covers the
4 light-emitting member,
5 wherein the light-emitting member is made up of a
6 plurality of light-emitting diodes that are set at
7 frequent intervals on the main surface of the polygonal
8 member, and
9 the polygonal member is a flexible substrate.

1 8. The light-emitting unit of Claim 7,
2 wherein at least one of the resin sheet and the
3 polygonal member is depressed in areas where the plurality
4 of light-emitting diodes are positioned.

1 9. The light-emitting unit of Claim 1,

2 wherein the light-emitting member is made up of a
3 plurality of light-emitting diodes that are set at
4 frequent intervals on the main surface of the polygonal
5 member, and

6 the light-emitting unit further comprises:
7 a light scatterer which scatters light emitted from
8 the plurality of light-emitting diodes.

1 10. The light-emitting unit of Claim 9 further
2 comprising:

3 a resin layer which has translucency and covers the
4 plurality of light-emitting diodes,

5 wherein the light scatterer is a metal powder mixed
6 in the resin layer.

1 11. A light-emitting unit assembly comprising
2 at least two light-emitting units,
3 wherein each light-emitting unit includes:

4 a flat polygonal member;

5 a light-emitting member which is provided on a main
6 surface of the polygonal member;

7 three sets of terminals, each set of terminals being
8 provided on a different side of a periphery of the
9 polygonal member; and

10 a wiring pattern which is provided to the polygonal

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11 member to connect the set of terminals with the
12 light-emitting member, and
13 wherein one side of a polygonal member of a
14 light-emitting unit on which a set of terminals has been
15 provided is set facing one side of a polygonal member of
16 another light-emitting unit on which a set of terminals
17 has been provided, and corresponding terminals on the
18 facing sides of the two light-emitting units are
19 electrically connected.

1 12. The light-emitting unit assembly of Claim 11
2 further comprising

3 a joint member which electrically connects the
4 corresponding terminals,

5 wherein in each light-emitting unit:

6 the light-emitting member is made up of a plurality
7 of light-emitting elements that emit light of different
8 colors;

9 the plurality of light-emitting elements are set at
10 frequent intervals on the main surface of the polygonal
11 member, with each light-emitting element being connected
12 in series with other light-emitting elements that emit
13 light of the same color as the light-emitting element;

14 the set of terminals includes a common terminal and
15 pairs of color terminals, the pairs of color terminals

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16 corresponding to the different colors;

17 the wiring pattern connects an electrode at one of
18 a low-potential end and a high-potential end of each group
19 of series-connected light-emitting elements to the common
20 terminal, and connects an electrode at the other end of
21 each group of series-connected light-emitting elements
22 to a pair of color terminals that corresponds to the same
23 color as the group; and

24 the set of terminals is provided so that the common
25 terminal is positioned at a midpoint of the side and two
26 color terminals that compose each pair of color terminals
27 are symmetrically positioned with respect to the common
28 terminal, and

29 wherein the corresponding terminals which are
30 located at directly opposing positions on the facing sides
31 of the two light-emitting units are electrically
32 connected using the joint member.

1 13. The light-emitting unit assembly of Claim 12,
2 wherein the joint member includes:

3 an insulating substrate which has flexibility; and

4 a plurality of contact electrodes which are formed
5 on a main surface of the insulating substrate, and which
6 each contact a different terminal on the facing sides of
7 the two light-emitting units.

1 14. The light-emitting unit assembly of Claim 11,
2 wherein in each light-emitting unit:

3 the light-emitting member is made up of a plurality
4 of light-emitting elements that emit light of different
5 colors;

6 the plurality of light-emitting elements are set at
7 frequent intervals on the main surface of the polygonal
8 member, with each light-emitting element being connected
9 in series with other light-emitting elements that emit
10 light of the same color as the light-emitting element;

11 the side of the polygonal member on which the set
12 of terminals is provided has alternating projections and
13 depressions;

14 the set of terminals includes a common terminal and
15 pairs of color terminals, the pairs of color terminals
16 corresponding to the different colors;

17 the common terminal and the pairs of color terminals
18 are arranged at the projections and the depressions;

19 the wiring pattern connects an electrode at one of
20 a low-potential end and a high-potential end of each group
21 of series-connected light-emitting elements to the common
22 terminal, and connects an electrode at the other end of
23 each group of series-connected light-emitting elements
24 to a pair of color terminals that corresponds to the same

25 color as the group; and
26 the set of terminals is provided so that the common
27 terminal is positioned at a midpoint of the side and two
28 color terminals that compose each pair of color terminals
29 are symmetrically positioned with respect to the common
30 terminal, and

31 wherein with projections provided on the side of the
32 light-emitting unit being fit into depressions provided
33 on the side of the other light-emitting unit, the
34 corresponding terminals which are located at directly
35 opposing positions on the facing sides of the two
36 light-emitting units are electrically connected.

1 15. A lighting apparatus comprising:
2 a plurality of light-emitting units; and
3 a feeder unit which is connected to an external power
4 supply,
5 wherein each light-emitting unit includes:
6 a flat polygonal member;
7 a light-emitting member which is provided on a main
8 surface of the polygonal member;
9 three sets of terminals, each set of terminals being
10 provided on a different side of a periphery of the
11 polygonal member; and
12 a wiring pattern which is provided to the polygonal

13 member to connect the set of terminals with the
14 light-emitting member,
15 the feeder unit includes:
16 a polygonal substrate; and
17 three sets of feeder terminals, each set of feeder
18 terminals being provided on a different side of a periphery
19 of the polygonal substrate, each feeder terminal being
20 connected in parallel to corresponding feeder terminals
21 on other sides,
22 the plurality of light-emitting units and the feeder
23 unit are joined at predetermined sides so as to form a
24 polyhedral shape, the predetermined sides each being a
25 side on which a set of terminal or a set of feeder terminal
26 has been provided, and
27 corresponding terminals on joined sides of the
28 plurality of light-emitting units are electrically
29 connected, and the plurality of light-emitting units are
30 each electrically connected to the feeder unit in
31 parallel.

1 16. The lighting apparatus of Claim 15,
2 wherein the plurality of light-emitting units are
3 joined by soldering the corresponding terminals on the
4 joined sides of the plurality of light emitting units.

1 17. The lighting apparatus of Claim 15 further
2 comprising:
3 a plurality of joint members which have connector
4 electrodes to be connected to terminals of the plurality
5 of light-emitting units,
6 wherein the plurality of joint plates are used to
7 join the plurality of light-emitting units.

1 18. A lighting apparatus that comprises a plurality
2 of light-emitting units and receives power from an
3 external power supply circuit,
4 wherein each light-emitting unit includes:
5 a flat polygonal member;
6 a light-emitting member which is provided on a main
7 surface of the polygonal member;
8 three sets of terminals, each set of terminals being
9 provided on a different side of a periphery of the
10 polygonal member; and
11 a wiring pattern which is provided to the polygonal
12 member to connect the set of terminals with the
13 light-emitting member, and
14 wherein the plurality of light-emitting units are
15 joined at predetermined sides so as to form a polyhedral
16 shape, the predetermined sides each being a side on which
17 a set of terminal has been provided, and

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18 corresponding terminals on joined sides of the
19 plurality of light-emitting units are electrically
20 connected, and the plurality of light-emitting units are
21 each electrically connected to the external power supply
22 circuit in parallel.

1 19. The lighting apparatus of Claim 18,
2 wherein the plurality of light-emitting units are
3 joined by soldering the corresponding terminals on the
4 joined sides of the plurality of light emitting units.

1 20. The lighting apparatus of Claim 18 further
2 comprising:
3 a plurality of joint members which have connector
4 electrodes to be connected to terminals of the plurality
5 of light-emitting units,
6 wherein the plurality of joint plates are used to
7 join the plurality of light-emitting units.